State of California

Business, Transportation and Housing Agency

Memorandum

To: MR. CARL SAVAGE
Department of Transportation
District 11
Design Branch, MS 35

Attention: Mr. Carl Savage

Date: August 30, 2001

File: 11-SD-56-KP 3.3/10.5
11-172821

Caltrans Metric

Sound Barrier Wall and
Soundwall with Barrier on Retaining Wall #1

From: **DEPARTMENT OF TRANSPORTATION**
DIVISION OF ENGINEERING SERVICES
Geotechnical Services
Office of Geotechnical Design - South
Structures Foundation South Branch

Subject: Foundation Recommendations

A request for foundation study and foundation recommendations was made by Distirct 11 Design Branch, January 5, 2001, for the proposed Sound Barrier Wall and Soundwall with Barrier on Retaining Wall #1. Office of Geotechnical Design – South, Structure Foundation - South Branch completed a foundation investigation and recommendation for the proposed wall. The foundation study consisted of a field investigation. The field investigation involved a site review and four augered exploratory borings. All elevations referenced in this memo and shown on the Log of Test Boring (LOTB) sheets are in meters, and are referenced to the 1988 NAVD Datum. The LOTB sheets will be forwarded to your office when completed.

Project / Site Description

The proposed project site is located in Carmel Valley, north of San Diego, State Route 56, west of the proposed Carmel Valley Road UC, Bridge #57-1077R/L on the south side of State Route 56. The proposed sound barrier wall is 470 m long. A 65 m section of the Sound Barrier Wall is proposed to be soundwall with Barrier on Retaining wall.

Geology

The foundation study revealed the soils at the project site consists of fill over quaternary alluvial deposits. The fill ranges in depth from 0 to 1.9 m deep, and consists of medium dense sand with silt and clay. The alluvial deposits consist of discontinuous beds and lenses of medium dense to very dense, poorly graded and well graded sand, gravel, silt, clayey sand, and localized cobbles. Two of the borings show siltstone at the bottom of the boring at elevations 38.3 m and 33.9 m. The siltstone is soft, moderately weathered and poorly cemented. Caving should not be a problem

with the silty sand and clayey sand soils. For site specific soil information, please refer to the LOTBs.

During the field investigation of 2001, ground water was not encountered in the exploratory borings. It is not anticipated that groundwater will be encountered during construction however, surface flows may occur due to seasonal rain run off.

Corrosion

The Materials Engineering and Testing Services, Testing and Technology Branch, has not performed corrosion tests on soil samples from the field investigation of 2001. However, corrosion tests from nearby projects indicate that soils at the site are not considered corrosive. Normal design techniques and construction can be used.

Foundation Recommendations

The following foundation recommendations are for the proposed Sound Barrier Wall and Soundwall with Barrier on Retaining Wall #1 as shown on the site plans and wall profile plans dated 11/15/2000. The proposed structure is a combination of Sound Barrier Wall and Soundwall with Barrier on Retaining Wall. The location and type of wall is shown in Table 1 below.

Table 1
Location and Type of Wall

Wall Type	Route 56 'A' line Stationing	"RW-1" Wall LOL Stationing
Sound Barrier Wall	34.4 m Rt. of Sta. 43+32 to 29.7 m Rt of Sta. 48+77	C/L of Sta. 10+00 to C/L of Sta. 12+50
Soundwall with Barrier on Retaining Wall	29.7 m Rt of Sta. 48+77 to 29.7 m Rt of Sta 49+42.6	C/L of Sta. 12+50 to C/L of Sta. 13+15
Sound Barrier Wall	29.7 m Rt of Sta 49+42.6 to 38.4 m Rt of Sta 51+00.3	C/L of Sta. 13+15 to C/L of Sta. 14+70

Cast-in-drilled-hole (CIDH) piles are recommended for the support of the proposed Sound Barrier Walls as shown in the Bridge Standard Details Sheets (4/2000), File numbers XS 3-57.1, XS 3-57.2, and XS 3-57.3. The finished grade of the proposed wall plans show level ground facing inside the state right of way and a sloping ground surface facing outside the state right of way indicating G-2 ground condition, the designer should use Case 2 for pile lengths. Some sections of the proposed wall will be placed in cut sections and the rest of the proposed wall will be placed on 0.5-6 m of embankment fill.

The proposed Soundwall with Barrier on Retaining Wall may be supported on spread footings as shown in the Bridge Standard Details Sheets (4/2000), File numbers XS 3-51, XS 3-92.1, and XS 3-92.2. The spread footing data is shown in Table 2 below.

Table No. 2
Soundwall with Barrier on Retaining Wall #1 Spread Footing Data

Approximate Support Location of Wall #1 on the "LOL" Line Stationing	Wall Height	Minimum Footing Width	Maximum Bottom of footing Elevation	Recommended Soil Bearing Pressures	
				ASD [1]	LFD [2]
				Gross Allowable Soil Bearing Pressure (q_{all})	Ultimate Soil Bearing Pressure(q_{ult}^*)
C/L sta.12+50.0 to C/L sta 12+64.4	1800 mm	1850 mm	41.5 m	140 kPa	N/A
C/L sta.12+64.4 to C/L sta 12+93.2	3000 mm	2300 mm	40.7 m	150 kPa	N/A
C/L sta.12+93.2 to C/L sta 13+02.8	3600 mm	2650 mm	40.7 m	150 kPa	N/A
C/L sta.13+02.8 to C/L sta 13+07.6	2400 mm	2050 mm	41.6 m	140 kPa	N/A
C/L sta.13+07.6 to C/L sta 13+12.4	2400 mm	2050 mm	42.3 m	140 kPa	N/A
C/L sta.13+12.4 to C/L sta 13+15.0	1800 mm	1850 mm	43.2 m	140 kPa	N/A

Notes: 1) Allowable Stress Design, (ASD). The Maximum Contact Pressure, (q_{max}), is not to exceed the recommended Gross Allowable Soil Bearing Pressure, (q_{all}). The Ultimate Soil Bearing Capacity, (q_{ult}), will equal or exceed 3 times the recommended Gross Allowable Soil Bearing Pressure, (q_{all}).
2) Load Factor Design, (LFD). The Maximum Contact Pressure, (q_{max}), divided by the Strength Reduction Factor, (ϕ), is not to exceed the recommended Ultimate Soil Bearing Pressure, (q_{ult}^*). The Ultimate Soil Bearing Capacity, (q_{ult}), will equal or exceed the recommended Ultimate Soil Bearing Pressure, (q_{ult}^*).

General Notes

Support locations for the spread footings are to be plotted on the Log of Test Borings in plan view as stated in "Memos to Designers" 4-2. The plotting of support locations should be made prior to requesting a foundation review.

Construction Considerations

1. Embankment fills at the wall sites should be placed at 95% relative as per Standard Specifications (July 1999), Section 19-5.03.

2. Care should be taken to avoid placing large rocks or other materials into the embankment fill which would impede drilling of the pile borings.

3. Footing concrete shall be placed neat on the undisturbed material of the bottom of the excavation. If the material at the bottom of the footing is disturbed, the material shall be compacted to a relative compaction of 95% as per Standard Specifications (1999) 19-5.03.

The recommendations contained in this report are based on specific project information regarding soundwall heights, retaining wall heights, final grade and wall locations that have been provided to Office of Geotechnical Design - South, Structure Foundation – South Branch. If any conceptual changes are made during final project design, Office of Geotechnical Design, Structure Foundation – South Branch, should review those changes to determine if the foundation recommendations contained in this report are still applicable.

Any questions regarding the above recommendations should be directed to Gina Pursell, (916) 227-1362 (CALNET 498-1362), or Mark DeSalvatore, (916) 227-7056 (CALNET 498-7056), of Office of Geotechnical Design - South, Structure Foundations – South Branch.

Report by: Date: 9/17/01

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Supervised by: Date: 9/14/01

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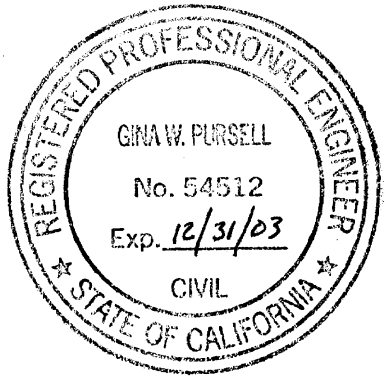

c: R.E. Pending File
DBarlow - Specs & Estimates
TRuckman - Specs Dev
OAlcantara – Project Development
LHuynh - PCE
APadilla– Material Investigations (D11)
JChai - OGDS
Geology – North
Geology - South
RGES - 30